

Claim Amendments

Please amend claims 1, 6, 8, 9-11, 14, 16-20 as follows.

Please cancel claims 13 and 15 as follows.

Please add new claim 21 as follows.

1. (currently amended) A method for preventing [a] photo-induced chemical attack on a copper oxide containing surface ~~containing dielectric material~~ comprising the steps of:

providing a ~~copper or copper oxide containing~~ substrate comprising a dielectric material having and an exposed copper containing surface comprising copper oxide;

providing an acidic cleaning solution for contacting the exposed copper containing surface; and,

shielding the exposed copper containing surface to substantially block incident light from impacting the exposed copper containing surface while contacting the exposed copper containing surface with the acidic cleaning solution.

2. (currently amended) The method of claim 1, wherein the ~~copper containing~~ substrate ~~includes~~ further comprises a semiconductor ~~substrate~~ wafer having and the copper containing surface comprises copper filled metal interconnects.

U.S.S.N. 10/082,009

3. (currently amended) The method of claim 1, wherein the incident light ~~source~~ has a wavelength of between about 300 nanometers and about 800 nanometers.

4. (original) The method of claim 1, wherein the acidic cleaning solution has a pH of between about 3.0 to about 4.5

5. (original) The method of claim 2, wherein the step of shielding is performed during a post-CMP cleaning process.

6. (currently amended) The method of claim 5, wherein the post-CMP cleaning process ~~includes~~ comprises contacting the substrate with the cleaning solution according to at least one of a dipping process, a brushing process, and megasonic cleaning process.

7. (original) The method of claim 6, wherein the post CMP cleaning process is automated for processing a substrate through a plurality of cleaning stations.

8. (currently amended) The method of claim 1, wherein the step of shielding ~~includes~~ comprises placing a light blocking means between the incident light and the copper containing ~~substrate surface~~ surface ~~to include the cleaning solution contacting the copper containing substrate.~~

U.S.S.N. 10/082,009

9. (currently amended) The method of claim 7 wherein the step of shielding ~~includes~~ comprises placing a light blocking means to at least partially surround each of the plurality of cleaning stations.

10. (currently amended) A method for preventing photo-induced chemical attack of a cleaning solution on a copper containing ~~dielectric layer in surface on a semiconductor wafer~~ comprising the steps of:

providing a copper containing ~~semiconductor wafer having an exposed surface including~~ comprising a copper containing dielectric layer formed on a semiconductor wafer;

performing a copper CMP process;

providing an acidic cleaning solution for ~~contacting~~ cleaning the copper containing dielectric layer surface; and,

shielding the cleaning solution and the copper containing ~~dielectric layer surface~~ to substantially block incident light while ~~contacting~~ cleaning the copper containing dielectric layer surface with the acidic cleaning solution in a cleaning process.

11. (currently amended) The method of claim 10, wherein the copper containing ~~dielectric layer surface~~ includes comprises copper filled metal interconnects.

U.S.S.N. 10/082,009

12. (original) The method of claim 10, wherein the incident light has a wavelength of between about 300 nanometers and about 800 nanometers.

13. (cancelled)

14. (currently amended) The method of claim 10[3], wherein the acidic cleaning solution has a pH of between about 3.0 to about 4.5.

15. (cancelled)

16. (currently amended) The method of claim 10[5], wherein the cleaning process ~~includes~~ comprises contacting the ~~substrate~~ copper containing surface with the acidic cleaning solution according to at least one of a dipping process, a brushing process, and a megasonic cleaning process.

17. (currently amended) The method of claim 16, wherein the cleaning process ~~includes~~ comprises an automated process for processing the substrate at a plurality of cleaning stations.

18. (currently amended) The method of claim 16, wherein the step of shielding ~~includes~~ comprises placing a light blocking means between the incident light and the cleaning process.

U.S.S.N. 10/082,009

19. (currently amended) The method of claim 18, wherein placing a light blocking means ~~includes~~ comprises placing a light blocking means to at least partially surround the cleaning process.

20. (currently amended) The method of claim 17 wherein the step of shielding ~~includes~~ comprises placing a light blocking means to at least partially surround each of the plurality of cleaning stations.

21. (new) The method of claim 10, wherein the copper containing surface comprises copper oxide.